APPENDIX B: Biographical Sketches of Committee Members

Chair

Rae Silver, Neuroscience. Rae Silver is Helen L. and Mark N. Kaplan Professor of Natural and Physical Sciences and holds joint appointments at Barnard College, Columbia University, School of Arts & Sciences, and Department of Anatomy and Cell Biology at College of Physicians and Surgeons at the Health Sciences campus. She is also a member of the Program in Neurobiology and Behavior, which encompasses faculty in Neurobiology and Neurosciences campus-wide. Rae Silver received the B.Sc. at McGill University, Montreal Canada, and the Ph.D. at Rutgers University, Newark N.J. She has served on numerous research review panels, editorial boards of several journals, is a member of scientific societies, and serves on the Society for Neuroscience program committee. She has an ongoing commitment to research and to undergraduate and graduate education.

Vice Chair

David Arthur Shirley, Chemical Physics. David Shirley has served as a Professor of Chemistry at the University of California, Berkeley, and as Associate Director and Director of the Lawrence Berkeley National Laboratory. He served as Senior Vice President for Research and Dean of the Graduate School and Professor of Chemistry and Physics at Penn State University. He is currently Director Emeritus, LBNL, and Professor Emeritus, UC Berkeley. Dr. Shirley's research has spanned various fields in chemical and nuclear physics. He led the effort to build the Advanced Light Source at LBNL. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences, and a Fellow of the American Physical Society. He holds an Sc.D. (h.c.) University of Maine, and Dr. ret. nat. (h.c.) Free University, Berlin. He has served on several committees for the US government, UNESCO, and the National Academy of Sciences.

Andreas Acrivos, Fluid Dynamics. Professor Acrivos is the Einstein Professor of Science and Technology, Emeritus, at the City College of the City University of New York. He obtained his B.S., M.S., and Ph.D. degrees in chemical engineering from Syracuse University and the University of Minnesota. For the past 40 years, Professor Acrivos has specialized in fluid mechanics and has investigated, theoretically and experimentally, a variety of fundamental problems involving the flow of viscous fluids and the associated heat and mass transfer phenomena. He is a member of the National Academy of Sciences and the National Academy of Engineering, and is a Fellow of the American Academy of Arts and Sciences, the New York Academy of Sciences, the American Physical Society, and the American Institute of Chemical Engineers. On June 13, 2002, Dr. Acrivos is due to receive the 2001 National Medal of Science from President Bush.

Roger Beachy, Plant Biology. Dr. Beachy is President of the Donald Danforth Plant Science Center located in St. Louis, Missouri. Dr. Beachy holds a Ph.D. in plant pathology from Michigan State University and has earned a B.A. in biology from Goshen College in Goshen, Indiana. He has held several ranking positions including Division Head of Plant Biology at The Scripps Research Institute, co-director of the International Laboratory for Tropical Agriculture, and Professor and Head of the Center for Plant Science and Biotechnology, Washington University Biology Department. Dr. Beachy has received several honors for his work including

election to the National Academy of Science, the Wolf Prize in Agriculture, the D. Robert Hoagland Award from the American Society for Plant Physiologists, the Common Wealth Award for Science Invention from the Bank of Delaware, and the Ruth Allen Award from the American Phytopathological Society. He is noted for his work in the development of the world's first genetically altered food crop and his contributions to a number of patent applications.

Raymond Bula, Plant Physiology. Dr. Bula earned his Ph.D., M.S., and B.S. from the University of Wisconsin-Madison and is currently a Principal in AgSpace Technologies International, LLC. He served as Director of the Wisconsin Center for Space Automation and Robotics, College of Engineering, University of Wisconsin-Madison where he led the successful ASTROCULTURE space flight experiment and hardware development program for the Space Shuttle, MIR, and International Space Station. Dr. Bula is a Fellow of the American Association for the Advancement of Science, the American Society of Agronomy, the Crop Science Society of America, the Honorary Society of Phi Kappa Phi, and is listed in American Men of Science and Who's Who in America. He is author or co-author of over 120 technical publications dealing with environmental and stress physiology of plants.

Noel Jones, Structural Biology. Noel D. Jones is retired as Research Advisor (Scientific Director) and Group Leader of Macromolecular Structure Research at Eli Lilly and Company, where he spent twenty-seven years. Subsequently he was for three years Vice President of Drug Design at Molecular Structure Corporation. He has extensive experience in macromolecular crystallography research, drug design and research management. His special expertise is in the development of automated instrumentation for protein crystallization and in the development of synchrotron beam lines for diffraction studies. Noel Jones has frequently served on NIH, NASA, and DOE review panels for evaluation of research programs. He served on the NRC Task Group for Evaluation of NASA's Biotechnology Facility for the International Space Station, 1999-2000 and the NRC Task Group for Research on the International Space Station (2001-2002)

Harold Metcalf, Atomic Physics. Dr. Metcalf was awarded a B.S. in Physics from MIT and his Ph.D. in Physics from Brown University. He has served as Visiting Professor at many academic institutions including the University of Innsbruck, RU Utrecht, Netherlands, and Ecole Normale Superieure, Paris, France; he is currently a Distinguished Teaching Professor at S.U.N.Y. Stony Brook. Dr. Metcalf is a life Member and Fellow of the American Physical Society and a member of A.P.S., O.S.A., A.A.P.T., and L.I.P.T.A. He is a Fellow of the Optical Society of America, a recipient of the Chancellor's Award for Excellence in Teaching, a Humboldt Prize Fellow, 1997-2002 at the Universities at Konstanz and Bonn, and Debye Hoogleraar, 2003 (University of Utrecht). His research interests include precision spectroscopy of simple atoms and molecules, quantum beats and atomic coherence, Zeeman spectroscopy, Stark spectroscopy of Rydberg atoms, and deceleration and cooling of atoms with laser light; he has published over 120 refereed papers and three books.

Patricia Morris, Materials Science. Patricia Morris is the Technology Manager of DuPont Chemical Sensors, leading the development of chemical sensors for environmental applications. She earned her B.S. in ceramic Engineering, Cum Laude, from Ohio State University and holds a Ph.D. in Ceramics in the Dept. of Materials Science and Engineering, with a Solid State Physics Minor, from MIT. Dr. Morris is the Vice President of the American Association for Crystal

Growth and a member on the Executive Committee of the American Association for Crystal Growth. She has served on the NSF Workshop on "Fundamental Research Needs in Ceramics" and as Associate Editor, J. Crystal Growth. Approximately 70 articles have been published on a variety of topics, ranging from thin film and bulk growth of oxides to the superconducting, nonlinear optical, photochemical and chemical sensing properties of materials.

Elaine Oran, Combustion Science. Dr. Elaine Oran is the Senior Scientist for Reactive Flow Physics at the Naval Research Laboratory. She received an A.B. degree in Physics and Chemistry from Bryn Mawr College, an M.Ph. from the Dept. Of Physics at Yale University, and a Ph.D. in Engineering and Applied Sciences from Yale. Dr. Oran is a Fellow of the American Institute of Aeronautics and Astronautics, and a Fellow of the American Physical Society; her honors include Zeldovich Gold Medal of the Combustion Institute, Honorary Professor of the University of Wales, and the Dryden Distinguished Lectureship of the AIAA. She is currently Associate Editor of the Journal of Computational Physics, Managing Editor of *Shock Waves* and has published over three hundred technical papers, written many review articles, given almost two hundred invited lectures, and coauthored the book Numerical Simulation of Reactive Flow (2nd edition Cambridge 2001).

Mary Jane Osborn, Microbial Biology. Dr. Osborn currently serves as Professor and Head of the Microbiology Department at The University of Connecticut Health Center School of Medicine. She received her B.A. in Physiology from the University of California, Berkeley and her Ph.D. in Biochemistry from the University of Washington. She has served as Assistant and Associate Professor, Albert Einstein College of Medicine, New York. Dr. Osborn is a member of the American Society of Biochemistry and Molecular Biology, the American Society of Microbiology, and the American Association for the Advancement of Science. Her honors include membership in the National Academy of Sciences and American Academy of Arts and Sciences, Chancellor's Distinguished Lectureship, University of California, Berkeley, Board of Governors, American Academy of Microbiology, and Advisory Committee, Princeton University Department of Molecular Biology. Dr. Osborn was a member of the NRC Panel on Biomedical and Biobehavioral Research Personnel Needs (1992-94), a member of the Space Studies Board (1994-2000), and Chair of the Committee on Space Biology and Medicine (1994-2000), and she is currently a member of the NAS Report Review Committee and Chair of the NRC Committee on Indicators for Waterborne Pathogens. Dr. Osborn has authored or co-authored over 80 scientific publications.

James A. Pawelczyk, Physiology. Dr. Pawelczyk is an Assistant Professor in the Department of Kinesiology and the Noll Physiological Research Center at the Pennsylvania State University, University Park, PA. He earned BA degrees in Biology and Psychology from the University of Rochester, NY; a MS in Physiology from Penn State University; a PhD in Biology from the University of North Texas, Denton, TX; and completed postdoctoral training in autonomic neurophysiology at the University of Texas Southwestern Medical Center, Dallas, TX. He served as a primary Payload Specialist on the STS-90 Neurolab mission in April and May of 1998. This 16-day mission was the final NASA Spacelab mission and was dedicated to life sciences (neuroscience) research. He is a member of the American College of Sports Medicine, American Heart Association, American Physiological Society, and Society for Neuroscience. His honors include a Doctorate in Public Service from the University of North Texas Health Science Center at Fort Worth, TX, the NASA Spaceflight Medal, and the Outstanding Faculty

Award from the Golden Key National Honor Society. He is an author on more than 100 books, articles and professional presentations.

Frederick Pohland, Environmental Engineering. Dr. Frederick G. Pohland is Professor and Edward R. Weidlein Chair of Environmental Engineering, Director of the Dominion Center for Environment and Energy, and Co-Director of the Groundwater Remediation Technologies Analysis Center at the University of Pittsburgh. He received his B.S. in Civil Engineering from Valparaiso University and his M.S. and Ph.D. in Environmental Engineering at Purdue University. He is a Registered Professional Engineer, an Honorary Member of the Water Environment Federation (WEF), an Honorary Member of the International Water Association, a Fellow and Life Member of the American Society of Civil Engineers (ASCE), a Diplomate in the American Academy of Environmental Engineers (AAEE), and a member of the National Academy of Engineering. His honors include the WEF Harrison Prescott Eddy Medal, the AAEE Gordon Maskew Fair Award, and the ASCE Simon Freeze Memorial Lecturer. Dr. Pohland has served as consultant and advisor to industry and government, and has over 150 technical and scientific publications.

Richard Roberts, Biotechnology-Genomics. Dr. Roberts is a Research Director at New England Biolabs in Beverly, Massachusetts. He was educated in England, attending the University of Sheffield where he obtained a B.Sc. in Chemistry and a Ph.D. in Organic Chemistry. He is a Fellow of the Royal Society and has received many distinguished awards including the Medicus Magnus of the Polish Academy of Medicine, the Golden Plate Award, Convocation Award, Sheffield University and has been the Albert Einstein Memorial Lecturer, Princeton. He is a shared award recipient of the 1993 Nobel Prize in Physiology or Medicine for the discovery of split genes. Dr. Roberts serves as Executive Editor of Nucleic Acids Research, as Chairman of the Scientific Advisory Boards of Celera Genomics and Lynkeus Biotech, and on the Scientific Advisory Boards of PubMed Central and Orchid Biosciences. His research interests include restriction endonucleases, DNA methylases, and computational molecular biology and he has over 200 scientific publications.

Rhea Seddon, Aerospace Medicine. Rhea Seddon is a former astronaut who holds a B.A. in Physiology from the University of California, Berkeley and an M.D. degree from the University of Tennessee College of Medicine. Besides working on Space Shuttle and Spacelab systems and operations at NASA, she also served on NASA's Institutional Review Board, Aerospace Medical Advisory Committee, International Bioethics Task Force, and as the Assistant to the Director of Flight Crew Operations for Shuttle/Mir payloads. Dr. Seddon was a Mission Specialist on STS 51D (1985) and STS 40 (1991) and the Payload Commander on STS 58 (1991) for a total of 30 days in space. She retired from NASA in 1997 and is now the Assistant Chief Medical Officer at the Vanderbilt University Medical Center in Nashville, TN. She is a member of the Institute of Medicine Committee on Aerospace Medicine.

Gary Stein, Cell Biology. Gary Stein currently serves as Professor and Chairman of the Department of Cell Biology at the University of Massachusetts Medical School and, also, as the Deputy Director for Research at the University of Massachusetts Cancer Center. He earned his B.A. and M.S. in Biology at Hofstra University, New York and his Ph.D. in Biology at the University of Vermont. Dr. Stein serves on the Editorial Board of over 20 science publications

and is a member of the National Cancer Institute Basic and Pre-Clinical Review Panel, on the Advisory Committee of St. Jude Children's Research Hospital, and on the Council of the American Society for Bone & Mineral Research. His honors include the Brown University Steroid Hormone Research Award, Elected member: Pakistan Academy of Sciences, and was appointed the Gerald L. Haidak, M.D. and Zelda S. Haidak Distinguished Professor and Chair of Cell Biology. Dr. Stein is credited as co-owner of three patents and has published hundreds of technical documents. Dr. Stein chaired the National Research Council's Panel that evaluated NASA's Biotechnology Research on the International Space Station (2000).

Fred Turek, Sleep and Circadian Biology. Dr. Turek is a Professor in the Department of Neurobiology & Physiology at Northwestern University and a Professor in the Departments of Neurology and Psychiatry & Human Behavior at Northwestern University Medical School. He earned his B.S. in Biology from Michigan State, his Ph.D. in Biological Rhythms from Stanford University in CA, and completed his postdoctoral Fellowship in Biological Rhythms at the University of Texas. He currently serves as a member of the Center for Reproductive Sciences, the Lurie Cancer Center, and the Buhler Center on Aging; as Director of the Center for Sleep and Circadian Biology; and as an affiliate of the Transportation Center. His selected honors include the John Guggenheim Memorial Fellowship, an NIH Research Career Development Award, two International Fogarty Fellowships, Endowed Chair: Charles E. and Emma H. Morrison Professor of Biology, and Distinguished Investigator Award from the National Alliance for Research on Schizophrenia and Depression. He is credited with 251 scientific publications.

Raymond Viskanta, Mechanical Engineering and Heat Transfer. Raymond Viskanta is currently W.F.M. Goss Distinguished Professor of Engineering at Purdue University, in the School of Mechanical Engineering. He earned his B.S. in Mechanical Engineering from the University of Illinois and his M.S. and Ph.D. in Mechanical Engineering from Purdue University. Professor Viskanta has broad knowledge of physical sciences, transport phenomena, mathematical modeling of thermal and combustion systems, and of experimental techniques. During the last 10 years he has served as a member of the U.S. Department of Energy and U.S. Nuclear Regulatory Commission constituted peer review panels. He was a member of the Space Studies Board of the NRC and served as Chairman of the Committee on Microgravity Research. Dr. Viskanta is a member of the National Academy of Engineering and is a Fellow of the American Institute of Aeronautics and Astronautics and the American Society of Mechanical Engineers. His honors include the ASME/AIChE Max Jakob Memorial Award, an honorary doctor of engineering degree (Doctor Honoris Causa) from the Technical University of Munich, and Foreign Member - Academy of Engineering Sciences of the Russian Federation. Professor Viskanta has authored or co-authored over 500 refereed papers, has prepared over 50 invited review articles, and has directed the doctoral research of over 100 students and post-doctoral researchers.

George Whitesides, Nanotechnology in Biomolecules. George Whitesides received an A.B. degree from Harvard University and a Ph. D. from the California Institute of Technology. He is employed as Mallinckrodt Professor of Chemistry at Harvard University. Dr. Whitesides received the National Medal of Science in 1999. He is a member of the American Academy of Arts and Sciences, the National Academy of Sciences, and the American Philosophical Society. He serves the National Research Council as a member of the Committee on Science and

Technology for Counterterrorism, and the Defense Science Board of the Department of Defense. Present research interests include materials science, biophysics, complexity, surface science, microfluidics, self-assembly, micro- and nanotechnology, and cell-surface biochemistry.

Pierre Wiltzius, Physics, Materials Sciences, and Engineering. Pierre Wiltzius received his Ph.D. in physics from the Swiss Federal Institute of Technology (ETHZ), Zurich, Switzerland. He currently serves as Director of the Beckman Institute for Advanced Science and Technology at the University of Illinois; a professor in both the Departments of Materials Science and Engineering, and Physics; and a full-time Beckman Institute faculty member in the Nanoelectronics and Biophotonics Group. Dr. Wiltzius has received many honors that include Fellow of the American Physical Society; Fellow of the American Association for the Advancement of Science; Senior Member of the IEEE; and R&D100 Innovation Award from R&D Magazine, Distinguished Member of Technical Staff at Bell Laboratories/Lucent Technologies. His fields of professional interest are soft-condensed matter, colloidal self-assembly, photonic crystals and microphotonics and he has published six scientific documents within the past 2 years.

Laurie Zoloth, Bioethics. Laurie Zoloth is Professor of Ethics and Director of the Program in Jewish Studies at San Francisco State University. In 2000, she was President of the American Society of Bioethics and Humanities. She is a member of the NASA National Advisory Council, the NASA Planetary Protection Advisory Committee, the NIH DSMB for Aids Research, the NIH ELSI Planning and Assessment Committee, the Executive Committee of the International Society for Stem Cell Research, and is the Chair of the Howard Hughes Medical Institute's Bioethics Advisory Board. Professor Zoloth received her BA in Women's Studies and History from the University of California at Berkeley, her BSN from the University of the State of New York, her MA in English from San Francisco State University, her MA in Jewish Studies and her Ph.D. in Social Ethics at the Graduate Theological Union in Berkeley. She has published extensively in the areas of justice and resource allocation, ethics, family, feminist theory, religion and science, Jewish Studies, and social policy and has authored 3 books, edited 3 others, and authored chapters in 27 books. She is the bioethics consultant to NASA Ames Research Center, and the NASA Interagency National Animal Care and Use Committees and is currently the emerging issues in medical and research genetics.